1.0 BAY AREA-MERCED CORRIDOR

The initial analyses for the Bay Area-to-Merced corridor were conducted for the following three segments:

- San Francisco-to-San Jose
- Oakland-to-San Jose
- San Jose-to-Merced

Alignment and station location options within these segments are illustrated in Figure 1-1.

1.1 San Francisco-to-San Jose

1.1.1 Alignment and Station Location Options for Further Evaluation

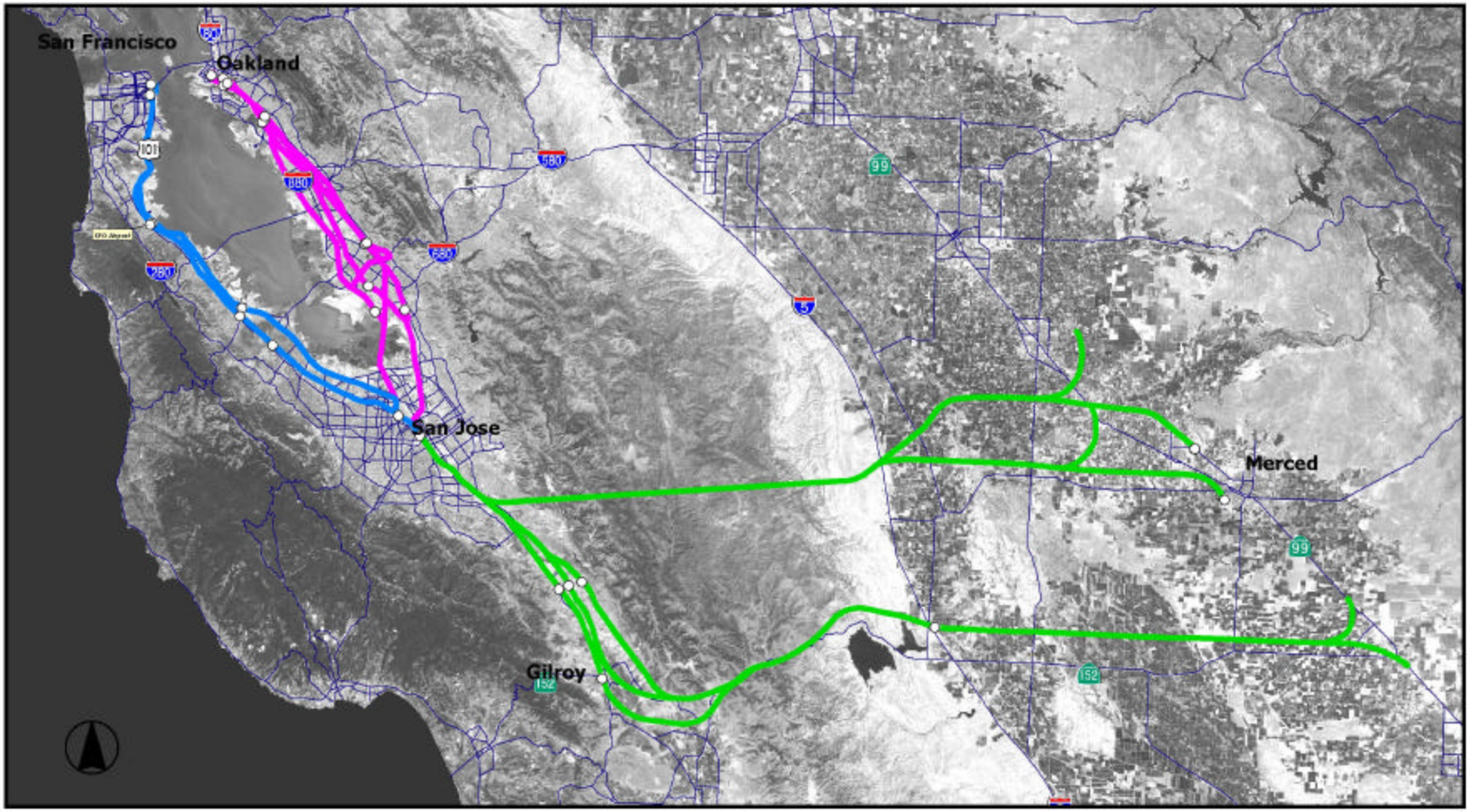
Based on information obtained through the initial evaluation, the following alignment and station location options are recommended for further evaluation (see Figure 1-2):

Alignments:

- **Caltrain Corridor (Shared-track with Caltrain):** From San Francisco, this alignment would follow south along the Catrain rail alignment to San Jose. This option assumes that high-speed trains would share tracks with Caltrain commuter trains. The entire alignment would be grade-separated. Station options include a station in the lower level of the proposed new Transbay Terminal in San Francisco and a station at 4th and King streets, a station in Millbrae (near the San Francisco International Airport), a station in either Redwood City or Palo Alto, and an optional station in Santa Clara.

For high-speed train service on the San Francisco Peninsula, only Caltrain Corridor shared-track options should be further evaluated. Sharing track with Caltrain would require that the steel-wheel-on-rail high-speed train technology be selected if the high-speed train system is to serve San Francisco without a transfer. Moreover, the high-speed trains would need to be compatible with the other trains sharing the tracks. Sharing tracks is likely to reduce the number of daily high-speed trains able to serve the Peninsula and increase travel times on the Peninsula. Nevertheless, sharing track with Caltrain is the only realistic alternative for a direct link to San Francisco.

Because of the lack of sufficient right-of-way along the Peninsula, dedicated (exclusive guideway) alternatives would require tall elevated structures along the Caltrain or U.S. 101 rights-of-way, and extensive purchases of additional right-of-way. In contrast, taking advantage of the existing rail infrastructure, the Caltrain Corridor Shared Use options would be predominately at-grade. Shared use options would have the least environmental impacts, and would be the least costly. In addition, for these alternatives a vastly improved regional commuter service – electrified, fully grade separated, with additional tracks and fencing – would help mitigate the impacts of additional rail service along the Peninsula. Shared use improvements in this corridor would not only result in safety and service improvements for Peninsula commuters, but would also improve automobile traffic flow at rail crossings, and reduce noise impacts – since a grade-separated system would eliminate trains blowing warning horns throughout the alignment. Shared use alternatives provide the opportunity for a partnership with Caltrain and the region that would lead to early corridor preservation for high-speed trains and provide a portion of the network that can be incrementally improved. While Samtrans (the owner of the right-of-way and operator of the Caltrain service) and the Peninsula as a whole have embraced the notion of high-speed trains sharing tracks with the Caltrain service, Samtrans has (on several occasions) formally commented that a dedicated (exclusive guideway) high-speed rail alternative along its right-of-way would be infeasible because there simply is not enough space for both types of services to operate separately.



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- Station Options
- Merced to San Jose Segment
- San Jose to Oakland Segment
- San Jose to San Francisco Segment

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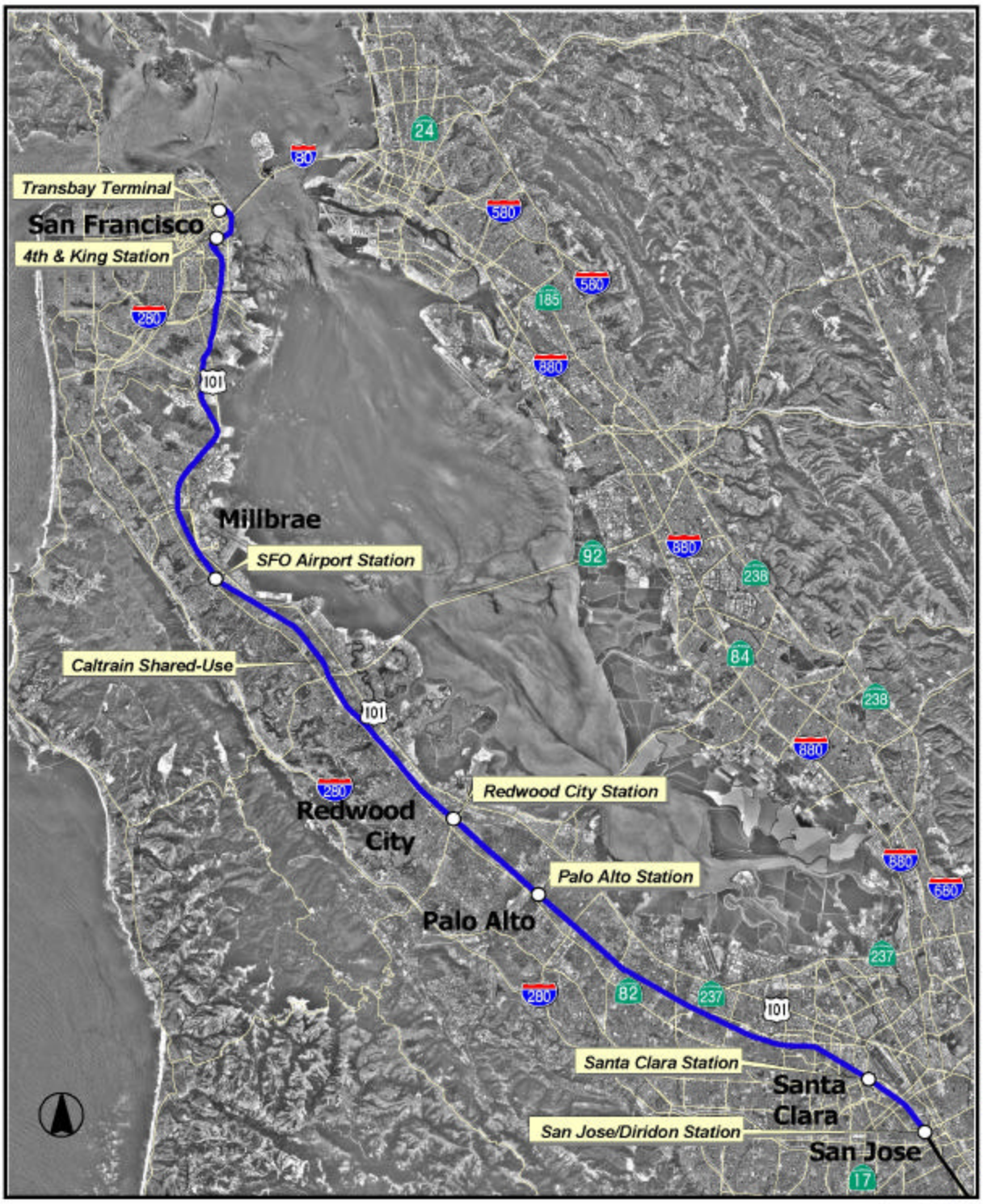
Bay Area to Merced Segments
Figure 1-1



Alignment and Station Locations to be Evaluated
San Francisco to San Jose Segment
Figure 1-2

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Travel times for the Caltrain Shared Use Four-track Alignment Option is estimated to be about five minutes longer than dedicated alternatives. For the Shared Use options, high-speed train operations would need to be coordinated and integrated with Caltrain and freight service. There would be a potential for delays or reduced service frequency for high-speed trains due to the need to share the tracks. The Four-track Alignment Option would reduce this potential for delays or reduced service frequency by eliminating the possibility of local Caltrains stopped at stations slowing or blocking high-speed trains.

Station Locations:

- **Transbay Terminal:** This potential station would serve the Caltrain Shared Use options.
- **4th and King:** This potential station would serve the Caltrain Shared Use options.
- **Millbrae (SFO Airport Station):** This potential station would serve the Caltrain Shared Use options.
- **Redwood City:** This potential station would serve the Caltrain Shared Use options.
- **Palo Alto:** This potential station would serve the Caltrain Shared Use options.
- **Santa Clara:** This potential station would serve the Caltrain Shared Use options.

1.1.2 Alignment and Station Location Options to be Eliminated (No Further Evaluation)

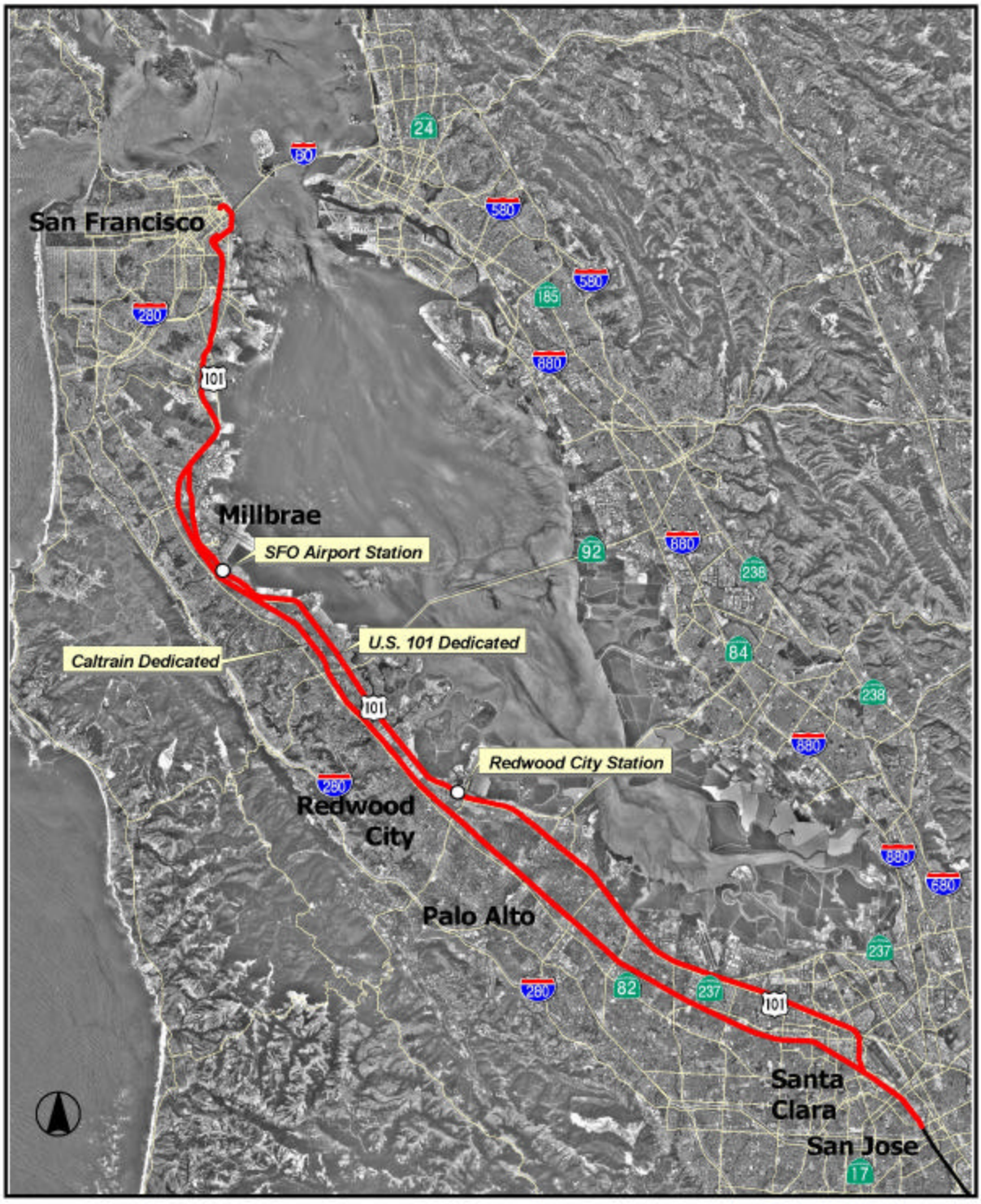
Based on information obtained through the initial evaluation, the following alignment and station location options are recommended to be eliminated from further evaluation (see Figure 1-3):

Alignments:

- **U.S. 101 Alignment:** From San Francisco (Transbay Terminal or 4th and King), this alignment would follow south along the U.S. 101 freeway alignment to San Jose. This alignment would be on an exclusive guideway in the U.S. 101 corridor.

This exclusive guideway alignment would have major construction issues, involving the construction of an aerial guideway adjacent to and above very busy and active existing freeway facility, while maintaining freeway traffic. Limited right-of-way in this corridor would require the extensive purchase of additional right-of-way and nearly exclusive use of aerial structure between San Francisco and San Jose. In San Francisco, major new tunnel construction is required.

The U.S. 101 freeway alignment would require many sections of high-level structures to pass over existing overpasses and connector ramps – resulting in the highest construction costs. This alignment would also require relocating and maintaining freeway access and capacity during construction. The aerial portions would introduce a major new visual element along the U.S. 101 corridor that would have critical visual impacts (intrusion/shade/shadow) on the residential portions for this alignment. In addition, the freeway has substandard features (e.g., medians and shoulders) in many places, and it is assumed that any room that might be available for high-speed train facilities likely would be used by Caltrans to upgrade the freeway in these areas. Construction of the tunnel in San Francisco from the Transbay Terminal site to 17th Street would be particularly difficult. Most of the tunnel would need to be constructed using compressed air techniques in very soft ground. Although the U.S. 101 alignment



Alignment and Station Locations to be Eliminated
San Francisco to San Jose Segment
Figure 1-3

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provides fast potential travel times, this alternative has the most impacts on public parklands and sensitive habitat near the Bay.

- **Caltrain Corridor (Exclusive Guideway):** From San Francisco (Transbay Terminal or 4th and King), this alignment would follow south along the Catrain rail alignment to San Jose. This alignment would be on an exclusive guideway within the Caltrain corridor.

This exclusive guideway alignment would have major construction issues, involving the construction of an aerial guideway adjacent to and above very busy and active existing transportation facilities, while maintaining rail traffic. It would require the extensive purchase of additional right-of-way and nearly exclusive use of aerial structure between San Francisco and San Jose. In San Francisco, major new tunnel construction is required.

The aerial portions of this alignment would introduce a major new visual element along the Caltrain corridor that would have critical visual impacts (intrusion/shade/shadow) on the residential portions for this alignment. For the Caltrain Exclusive Guideway alternative, introduction of the elevated structure (for the high-speed tracks and stations) would also have adverse impacts on the suburban town centers along the Caltrain corridor (San Mateo, San Carlos, Redwood City, Menlo Park, Palo Alto, and Mountain View). Although the structure would generally be in a commercial area in these centers, it would represent a barrier for land use and urban design, depending on design and environmental mitigation characteristics. Construction of the tunnel in San Francisco from the Transbay Terminal site to 17th Street would be particularly difficult. Most of the tunnel would need to be constructed using compressed air techniques in very soft ground. Although the Caltrain Exclusive Guideway alignment provides faster potential travel times, this alternative has the most impacts on cultural resources and is the least compatible with the existing and planned development on the Peninsula. Samtrans has formally commented that this alternative is not compatible with their existing and planned Caltrain services and is not feasible in its right-of-way.

Station Locations:

- **Millbrae – SFO Airport Station (US101)**: This potential station site would only serve the US101 Dedicated alternative that staff recommends be eliminated from further investigation.

- **Redwood City (US101)**: This potential station site would only serve the US101 Exclusive Guideway alternative that staff recommends be eliminated from further investigation.

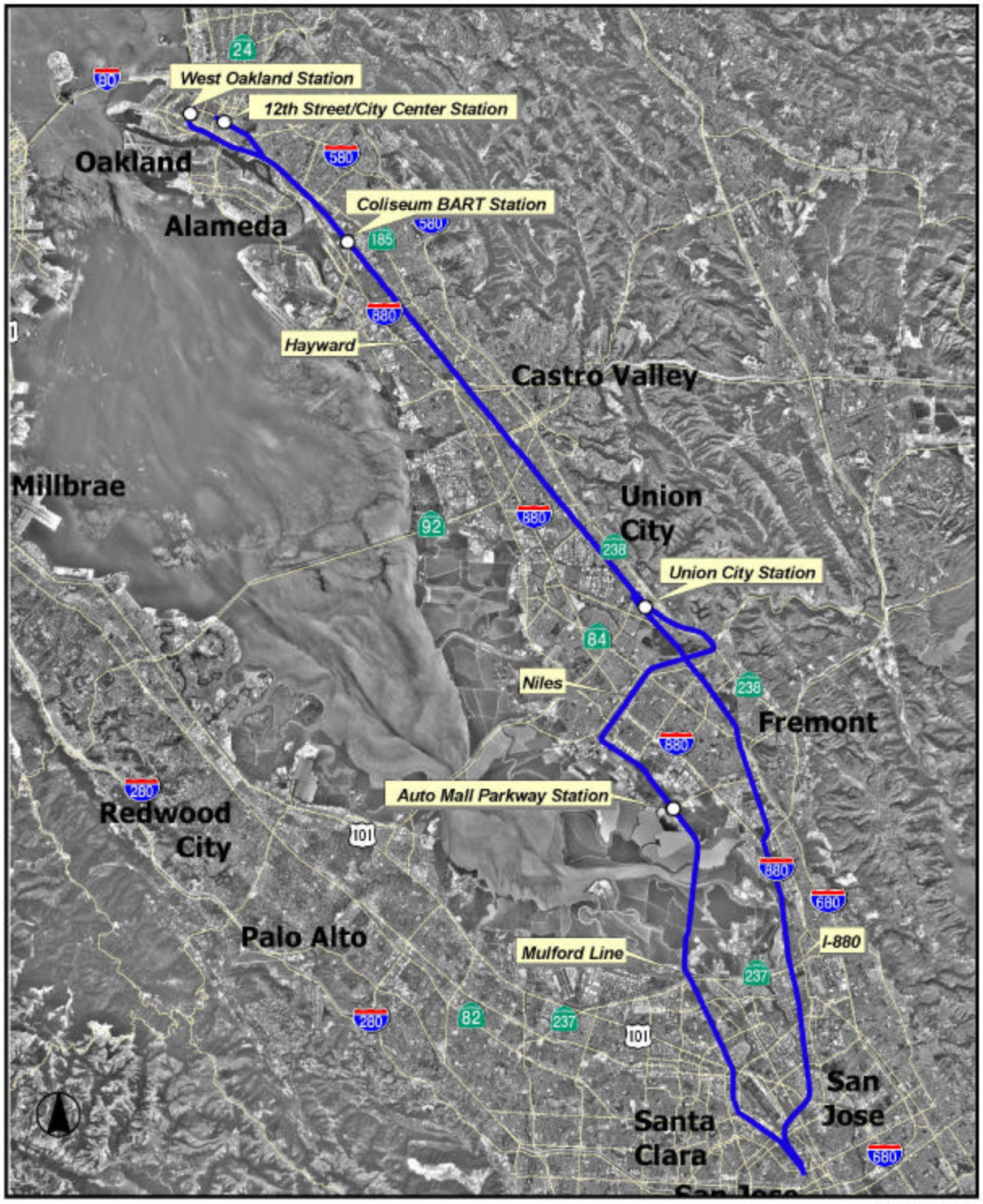
1.2 Oakland-to-San Jose

1.2.1 Alignment and Station Location Options for Further Evaluation

Based on information obtained through the initial evaluation, the following alignment and station location options are recommended for further evaluation (see Figure 1-4):

Alignments:

Hayward Line to the I-880 (Hayward Alignment/I-880): From Oakland, this alignment would travel south following the UPRR's Hayward rail line and then transition to I-880. Station options include downtown Oakland, the Oakland Airport/Coliseum, and Union City (BART Station). The Hayward Line to I-880 provides the shortest alignment (42 miles/67.6 km), the fastest travel time (25 minutes), and the highest ridership and revenue potential. It is also projected to have the lowest capital costs.



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Alignments to be Evaluated

Station Locations to be Evaluated

Alignment and Station Locations to be Evaluated
Oakland to San Jose Segment
Figure 1-4

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The alignment would be at-grade along the Hayward Line and on an aerial structure in the median of I-880 (the I-880 is mostly on aerial configuration from San Jose to Fremont). This alternative is the most compatible with existing and planned development.

The two most negative aspects of this alternative are construction issues associated with constructing columns and footings in the wide median of I-880, and the tunnel under Fremont Central Park Lake that would represent major construction issues.

- **Hayward Branch through Niles Junction to the Mulford Line (Hayward/Niles/Mulford Alignment)**: From Oakland this alignment would travel south along UPRR's Hayward Line to the UPRR's Niles Line and then onto the UPRR's Mulford Line. Station options include downtown Oakland, the Oakland Airport/Coliseum, Union City (BART Station), Fremont (Auto Mall Parkway).

This alternative is the alignment currently used by the existing "Capitol" intercity passenger rail service. This alignment provides low capital costs, the greatest opportunity for connectivity, and potential partnership/incremental improvements with the existing Capitol service.

This alignment is the longest (49 miles/79 km) and the slowest. The longest travel times are for alignments using the existing Niles Junction tracks, which have some significant right-angle turns resulting in travel times up to 12 minutes longer than the I-880 to the Hayward Line alternative. The Mulford Line portion of this alignment must traverse four miles of the Don Edwards San Francisco Bay National Wildlife Refuge - a major wildlife and bird sanctuary with potentially serious 4f impacts. Nevertheless, this alignment is the most viable alternative to the Hayward Line to I-880 alignment. Future investigation of this alternative would include focusing on potential engineering solutions to increase speed between the Niles Junction and the Mulford Line and further discussions with the Capitol Rail Service regarding the possibility for shared use of passenger tracks on this alignment.

Station Locations:

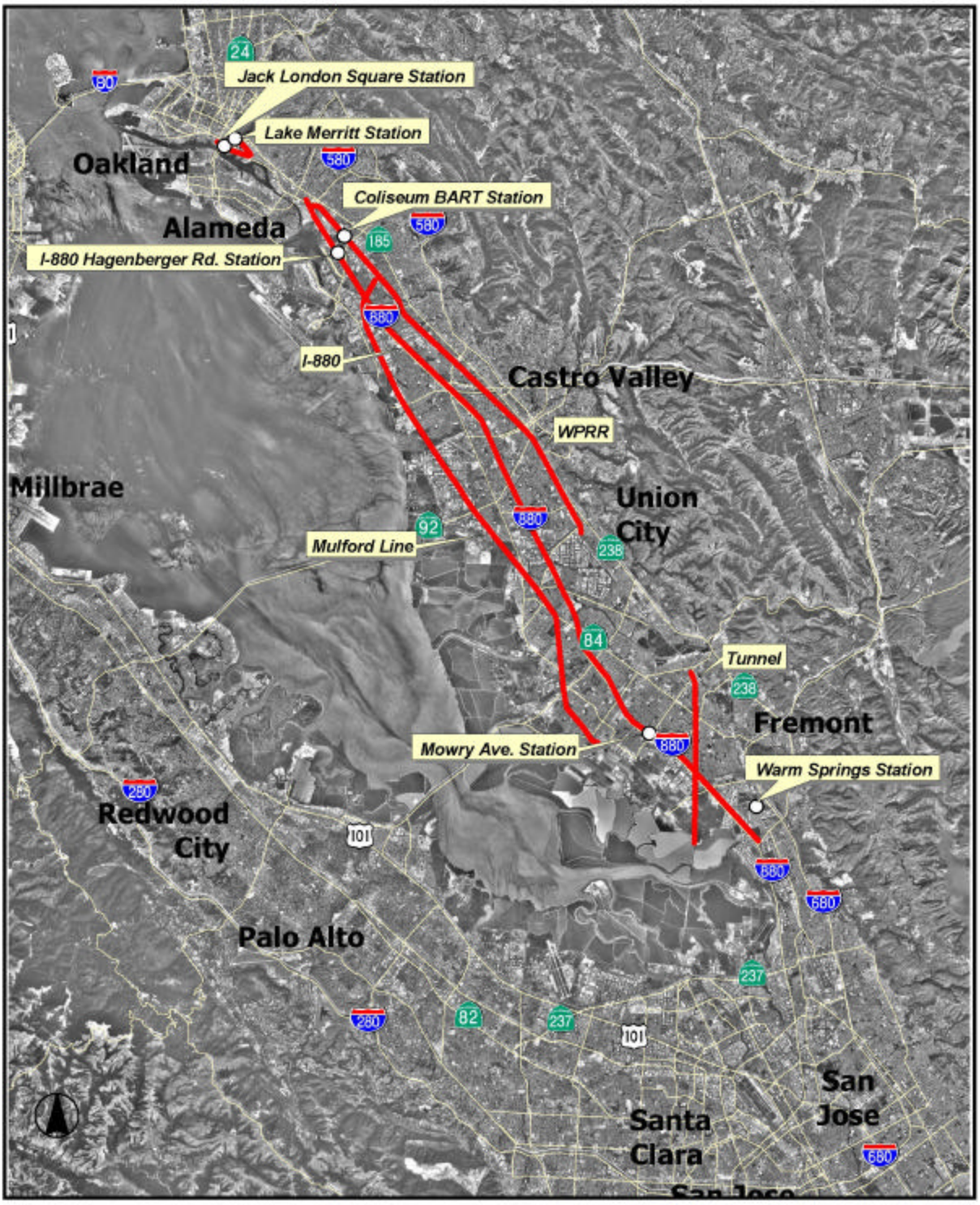
- **West Oakland:** This potential station would serve both the Hayward/Niles/Mulford Line and the Hayward/I-880 Line.
- **12th Street/City Center:** This potential station would serve both the Hayward/Niles/Mulford Line and the Hayward/I-880 Line.
- **Coliseum BART Station (Hayward/Mulford)**: This potential station would serve both the Hayward/Niles/Mulford Line and the Hayward/I-880 Line.
- **Union City**: This potential station would serve both the Hayward/Niles/Mulford Line and the Hayward/I-880 Line.
- **Fremont (Auto Mall Parkway)**: This potential station would serve the Hayward/Niles/Mulford Line.

1.2.2 Alignment and Station Location Options to be Eliminated (No Further Evaluation)

Based on information obtained through the initial evaluation, the following alignment and station location options are recommended to be eliminated from further evaluation (see Figure 1-5):

Alignments:

- **Mulford Line (Entire Segment)**: From Oakland, this alignment would follow south along UPRR's entire Mulford Line.



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Alignments to be Eliminated

Station Locations to be Eliminated

Alignment and Station Locations to be Eliminated
Oakland to San Jose Segment
Figure 1-5

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The Mulford Line (Entire Segment) would have high capital costs and the highest environmental impacts. It would create severe visual impacts, and greatest impacts on social and economic resources and minority populations while being the least compatible with existing and planned development. This alignment would require a portion of the UPRR corridor (that is generally 60 feet/18.3 km wide) for aerial structure foundations and for an aerial easement over the tracks. In addition, a 50-foot/15.3 km right-of-way strip would be needed from the residential, commercial, and light industrial areas to the east of the alignment. The Mulford Line would cross multiple marshlands, seasonal wetland, rivers, plus the approximately four miles of the Don Edwards San Francisco Bay National Wildlife Refuge.

- **I-880 (Entire Segment)**: From Oakland, this alignment would follow I-880 south to San Jose.

The I-880 (Entire Segment) Alignment would require significant ROW in the more northern area to be able to expand the highway sufficiently to allow for high-speed tracks in the median. The I-880 Alignment would be mostly an aerial configuration requiring construction of footings within the highway ROW and lane closures during construction. This likely would require in off-peak construction which is time consuming and costly. As the highway narrows, adding high-speed rail would require full median widening, and present construction issues similar to major highway reconstruction – demolition of existing adjacent property, new noise walls, demolition of existing noise walls, construction of new highway lanes, and maintenance of traffic. This alternative would have the highest capital costs, exhibits greater construction issues, and is projected to have less ridership potential than the Hayward/I-880 Line.

- **Former WPRR Rail Line to the Hayward Line to the I-880 (WPRR Alignment/Hayward/I-880)**: From Oakland, this alignment would follow the UPRR (old WPRR) Rail Line transition to UPRR's Hayward Line and then transition to I-880.

This alternative would be nearly entirely on an aerial structure. The high-speed train structures for the WPRR alignment would be similar to the BART structures adjacent to it, thereby having a lesser visual impact. The WPRR Alignment would have major construction issues including rearrangement of BART foundations to allow for the high-speed alignment to pass from one side of BART to the other. In contrast, the proposed alignment along the Hayward branch would be at-grade and follow the existing freight and commuter railroad. The WPRR Line/Hayward/I-880/ is projected to have less ridership potential while having more construction impacts than the Hayward Line/I-880 alternative.

- **Former WPRR Rail Line through Niles Junction to the Mulford Line (WPRR/Niles/Mulford Alignment)**: From Oakland, this alignment would follow UPRR (formerly WPRR) Rail line onto the UPRR's Hayward Line, to UPRR's Niles Line, and the UPRR's Mulford Line.

This alternative would be nearly entirely on an aerial structure. The high-speed train structures for the WPRR alignment would be similar to the BART structures adjacent to it, thereby having a lesser visual impact. The WPRR Alignment would have major construction issues including rearrangement of BART foundations to allow for the high-speed alignment to pass from one side of BART to the other. In contrast, the proposed alignment along the Hayward branch would be at-grade and follow the existing freight and commuter railroad. The WPRR/Niles/Mulford Line is projected to have less ridership potential while having more construction impacts than the Hayward/Niles/Mulford Line alternative.

- **Hayward Line via a tunnel to the Mulford Line (Hayward/Tunnel/Mulford Alignment)**: From Oakland, this alignment would follow south along UPRR's Hayward Line to a tunnel leading to UPRR's Mulford UPRR's Line.

The tunnel alternatives under Fremont would have the highest projected costs and the tunnel segment would introduce critical environmental impacts. The purpose of a tunnel would be to improve travel times and eliminate tight curves. However, eliminating tight curves would result in tunnel alignments

through the City of Fremont that do not follow under existing transportation rights-of-way. This alternative is not compatible with the existing development and has the maximum geologic impacts and soils constraints.

- **Former WPRR Line via a tunnel to the Mulford Line (WPRR/Tunnel/Mulford Alignment)**: From Oakland, this alignment would follow UPRR (former WPRR) Rail Line transitioning to UPRR's Hayward Line to a tunnel leading to UPRR's Mulford Line.

The tunnel alternatives under Fremont would have the highest projected costs and the tunnel segment would introduce critical environmental impacts. The purpose of a tunnel would be to improve travel times and eliminate tight curves. However, eliminating tight curves would result in tunnel alignments through the City of Fremont that do not follow under existing transportation right-of-way. This alternative is not compatible with the existing development and has the maximum geologic impacts and soils constraints.

Station Locations:

- **Lake Merritt:** The Lake Merritt Station would have the most potential adverse effects in residential areas during construction. Residential uses are more proximate to these station sites, compared to the Jack London Square and the City Center, which are more commercial in nature. The Lake Merritt Station and alignment segment would require construction of a tunnel or subway through the campus of Laney College adjacent to the BART alignment. While similar in cost, and constructibility to the 12th Street/City Center station location, the Lake Merritt alternative is not as compatible with existing development, does not provide as good a BART connection (the 12th Street Station is a "transfer station" which serves all BART lines), and does not serve downtown Oakland as well.

- **Jack London Square:** The Jack London Square Station and alignment leading to and from it would be in bored tunnels in the bay mud underneath the Embarcadero and the active UPRR tracks. Relocating the railroad even temporarily is probably not an option. A cut-and-cover access would need to be constructed within the Amtrak parking lot and a mined concourse excavated over the bored tunnels – this alternative has the most geologic and soils constraints of the Oakland terminus alternatives. A terminus high-speed train station at Jack London Square would be extremely difficult construction and would be the most costly alternative to serve Oakland. Although the Jack London Square location would serve a thriving commercial center and a direct link to Amtrak, unlike the other Oakland terminus alternatives, this terminus would not provide a connection with BART. In addition to being projected to be more costly and more difficult to construct, this alternative does not provide the accessibility and direct link to the center of downtown Oakland as the 12th Street/City Center alternative does.

- **I-880 Hegenberger**: This potential station site would only serve the I-880 (Entire Segment) alignment that staff recommends be eliminated from further investigation.

- **Coliseum BART Station (WPRR):** This potential station site would only serve the Mulford/Niles/WPRR alignment and I-880/WPRR alignment that staff recommends be eliminated from further investigation.

- **Fremont – Warm Springs**: This potential station would serve the I-880/Hayward Line. Major issues associated with the Warm Springs Station include the need to relocate the planned BART station to the east and construct the high-speed rail station and facilities between two active railroads – BART and the UPRR. Relocating BART under operating conditions would be a very difficult task technically and operationally, and could be cost-prohibitive.

- **Mowry Avenue**: This potential station site would only serve the I-880 (Entire Segment) alignment that staff recommends be eliminated from further investigation.

1.3 San Jose-to-Merced

1.3.1 Alignment and Station Location Options for Further Evaluation

Based on information obtained through the initial evaluation, the following alignment and station location options are recommended for further evaluation (see Figure 1-6):

Alignments:

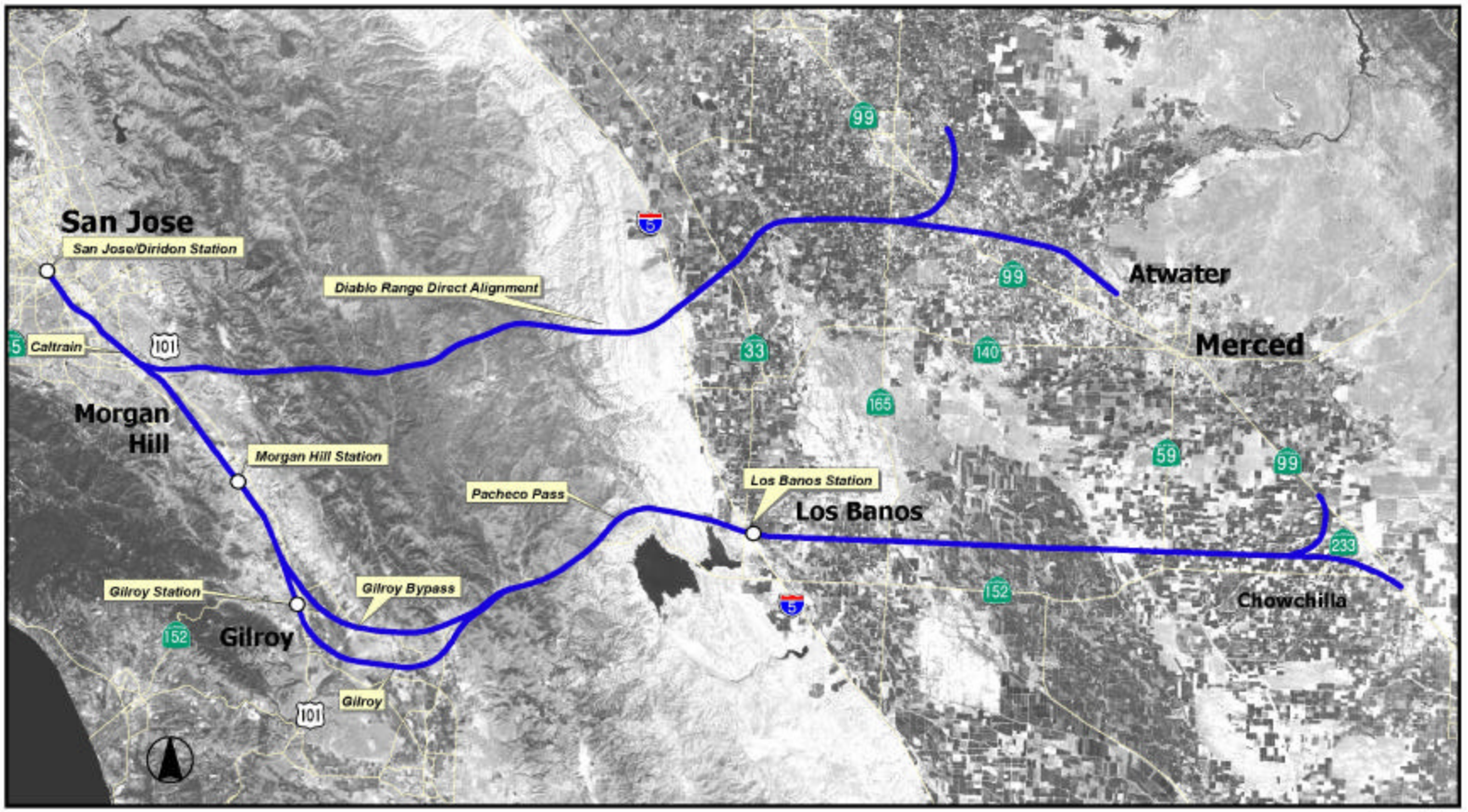
- **Diablo Range Direct Alignment (3.5% Maximum Grade)**: This alignment would have a station at the existing San Jose (Diridon) Station heading south on the Caltrain/UPRR, just north of I-85 turning east through the Diablo Range to San Joaquin Valley to Merced using the northern alignment (near Castle Air Force Base).

This Diablo Range Direct Alignment (about 92 miles long) would be shorter in length than the Pacheco Pass Alignment options by 24 miles, and would offer far superior travel times from Sacramento to the Bay Area as compared to Pacheco Pass options. It would be approximately 28 minutes faster from Sacramento to San Jose than the Caltrain/Gilroy/Pacheco Pass Alignment for express (nonstop) services, with a difference of 35 minutes for local trains. For local trains traveling from San Jose to Los Angeles, the Diablo Range Direct Alignment would save 11 minutes compared to the Gilroy/Pacheco Pass Alignment that has local stops in Gilroy and Los Banos (express service travel times would be about the same). Operational cost savings would occur for this service, given that the amount of alignment traveled for the Diablo Range Direct Alternative would be approximately 64-miles shorter than the Gilroy/Pacheco Pass Alignment for service between Sacramento and San Jose. In addition, the Diablo Range Direct Alignment option would place the Merced Area on the Los Angeles-to-Bay Area line, with more frequent train services compared to the Sacramento-to-Bay Area line. For these reasons, this Diablo Range Direct Alternative is expected to have the highest ridership and revenue potential and to maximize connectivity and accessibility.

The Diablo Range Direct Alignment would have about 11 total miles of tunneling required, with no continuous tunnel exceeding 5-miles in length. The alignment would cross three active and potentially active faults at-grade including the Ortigalita Fault, the southern extension of the Greenville Fault trend, and the Calaveras Fault zone. The most negative aspects of this alignment are that it bisects a portion of the Henry W. Coe State Park and it is located several miles south of the nearest access road (SR-130). If these constraints cannot be adequately mitigated, a variation of this alignment has been identified that bypasses the Henry W. Coe State Park to the north, and has good access to SR-130, however, it has about 16.5-miles of total tunneling (with no single tunnel exceeding 5.5 miles in length).

- **Caltrain/Gilroy/Pacheco Pass Alignment (3.5% Maximum Grade)**: This alignment would extend south along the Caltrain/UPRR rail corridor through the Pacheco Pass and then the San Joaquin Valley to Merced. Station options include the existing San Jose (Diridon) Station, Gilroy (near the existing Caltrain Station), and Los Banos (near I-5) in the San Joaquin Valley.

The Pacheco Pass alternatives would minimize the amount of tunneling required between San Jose and Merced. Tunneling through this pass could be reduced to a total as little as about 5-miles. This Pacheco Pass Alignment would provide potential high-speed train service to the Morgan Hill or Gilroy and the Los Banos areas. In addition to serving the City of Gilroy, this alignment would best serve the Salinas/Monterey Bay populations. This alignment would have the most impacts on natural resources



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Alignments to be Evaluated

Station Locations to be Evaluated

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Alignment and Station Locations to be Evaluated
Merced to San Jose Segment

Figure 1-6

and social and economic resources, but would maximize avoidance of areas with erodible soils and steep slopes as compared with the other Pacheco Pass alternatives.

- **Morgan Hill/Caltrain/Pacheco Pass Alignment (3.5% Maximum Grade)**: This alignment would extend south along the Caltrain/UPRR rail corridor through the Pacheco Pass and San Joaquin Valley to Merced. Station options include the existing San Jose (Diridon) Station, Morgan Hill (near the existing Caltrain Station), and Los Banos (near I-5) in the San Joaquin Valley.

This alignment would be shorter than the Gilroy alignment by three to four miles, and would reduce impacts to water resources, farmlands, and floodplains as compared to the Gilroy/Caltrain/Pacheco Pass alternative but would have additional erodible soils, and steep slope constraints. Travel times and costs would be slightly improved with this option, but there would be a reduction in connectivity and accessibility to the region as a whole since Gilroy could not be served directly. Since there is no existing transportation corridor linking the Pacheco Pass to Morgan Hill via the Pacheco Pass, additional study is needed to refine this portion of the route to optimize its feasibility and minimize its community and environmental impacts.

Station Locations:

- **San Jose (Diridon) Station:** This potential station would serve all alignment options (Caltrain/Monterey Highway rights-of-way) into San Jose.
- **Morgan Hill (Caltrain) Station:** This potential station would serve the Pacheco Pass/Gilroy/Caltrain and Pacheco Pass/Caltrain/Morgan Hill alignment options.
- **Gilroy Station:** This potential station would serve the Pacheco Pass/Gilroy/Caltrain option.
- **Los Banos Station:** This potential station would serve the Pacheco Pass/Gilroy/Caltrain and Pacheco Pass/Caltrain/Morgan Hill alignment options.

1.3.2 Alignment and Station Location Options to be Eliminated (No Further Evaluation)

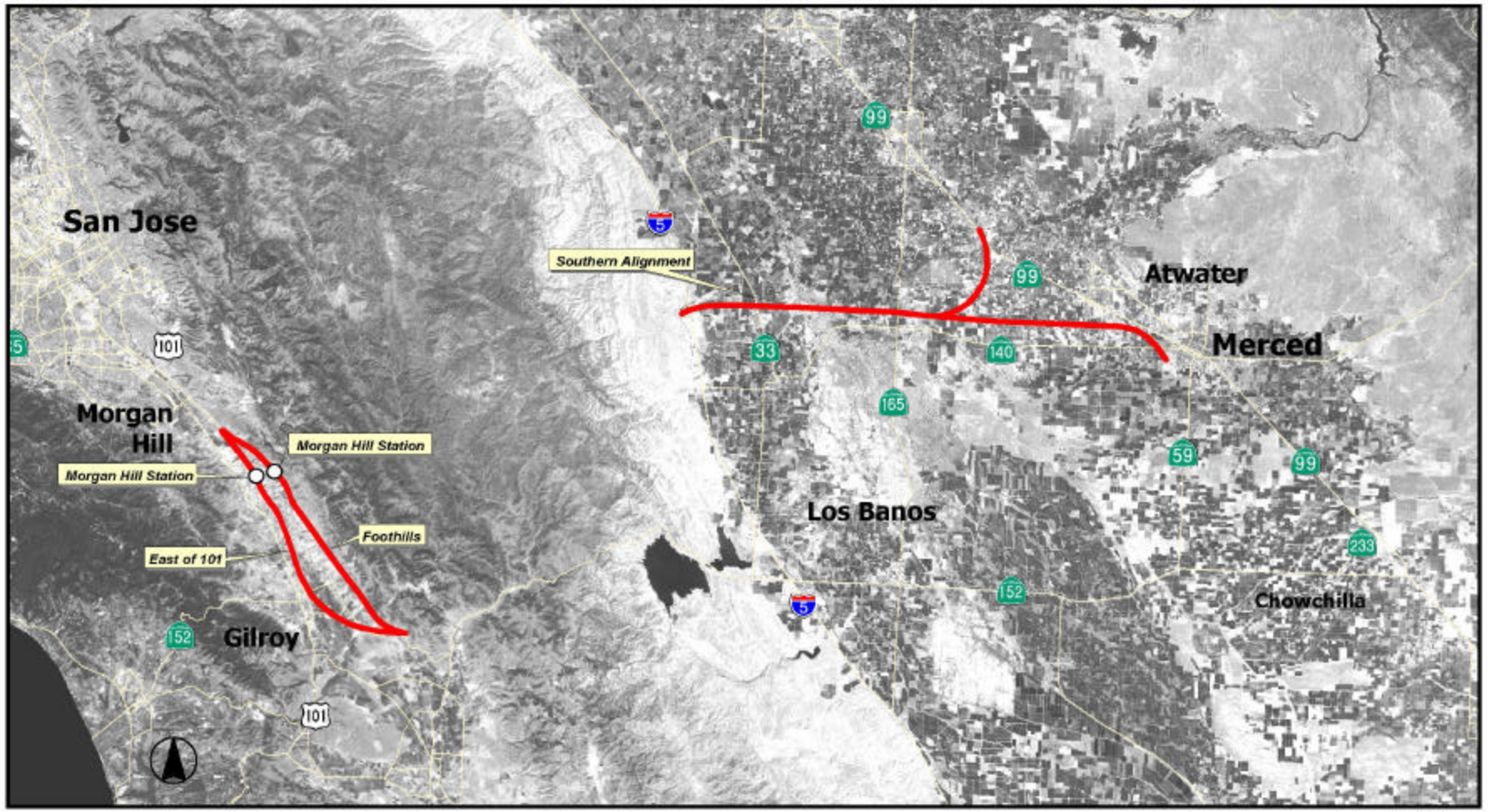
Based on information obtained through the initial evaluation, the following alignment and station location options are recommended to be eliminated from further evaluation (see Figure 1-7):

Alignments:

- **Southern Alignment (Central Valley portion of San Jose-Merced Segment)**: This alignment would extend from the eastern base of the Diablo Range through the San Joaquin Valley to Merced (at a Merced Municipal Airport Station).

The Southern Alignment should be eliminated from further investigation since the northern alignment through the Central Valley is a superior alternative. A northern alignment provides for faster travel times between Sacramento and San Jose, and enables all potential Merced station locations to be served on the Los Angeles-to-Bay Area train line (rather than the Sacramento-to-Bay Area line), providing more frequent service to Merced. For the Southern Alignment, only the southern Merced station locations (excluding Castle Air Force Base and U.C. Merced) could be served on the Los Angles-to-Bay Area line.

The Southern Alignment would pass through the San Luis National Wildlife Refuge, which is characterized by major wetland areas, while the northern alignment would pass to the north of this Refuge. The Southern Alignment passes through a greater length of wetlands – approximately 4.4 miles (7 km), including the San Luis Wildlife Refuge, compared to the northern alignment that would pass through an



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Alignments to be Eliminated

Station Locations to be Eliminated

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Alignment and Station Locations to be Eliminated
Merced to San Jose Segment

Figure 1-7

estimated 2.4 miles (3.8 km) of wetland areas and passes beyond the limits of the Wildlife Refuge. The Southern Alignment would also pass though a higher length of floodplain, more farmlands of statewide importance, and more sensitive habitats as compared to the northern alignment.

- **Direct Tunnel Alignment**: This alignment would have a station at the existing San Jose (Diridon) Station heading south on the Caltrain/UPRR, just north of I-85 turning east into a long (31-mile-49.6 km) tunnel to San Joaquin Valley to Merced (near Castle Air Force Base).

The Direct Tunnel Alignment would cross three active and potentially active faults in tunnel including the Ortigalita Fault, the southern extension of the Greenville Fault trend, and the Calaveras Fault zone. The Direct Tunnel Alignment is likely to cost at least $2 billion more than the Diablo Range Direct Alignment that utilizes a 3.5% gradient to minimize tunneling. This higher cost is due largely to the long tunnel and the high unit cost per-mile associated with tunnels that exceed 6-miles in length. The Direct Tunnel concept would involve construction of a tunnel that would be among the longest in the world (31 miles/49.6 km) though difficult mixed soil and geology types. The results of the Tunneling Summit concluded that in California, a tunnel of this length, while not infeasible, is prohibitive from a construction, operation and cost perspective.

- **Caltrain/Morgan Hill/Foothill/Pacheco Pass Alignment**: This alignment would extend south along the Caltrain/UPRR rail corridor, traveling south in the foothills east of U.S. 101 through the Pacheco Pass and the San Joaquin Valley to Merced.

The Caltrain/Morgan Hill/Foothill/Pacheco Pass Alignment is the least costly of all alignments in this segment, primarily due to less tunneling and its shorter length compared to the other Pacheco Pass alignments. However, this alignment would have the most impacts to sensitive habitat (through the foothills), and would have high visual impacts. This new transportation corridor through the foothills would be the least compatible with existing and planned development, yielding severe impacts on the existing suburban, rural and open space areas in the foothills, and would provide minimal connectivity and accessibility. It would not link to the Caltrain commuter rail service south of San Jose.

- **Caltrain/Morgan Hill/East 101/Pacheco Pass Alignment**: This alignment would extend south along the Caltrain/UPRR rail corridor transitioning to south U.S. 101 east through the Pacheco Pass and the San Joaquin Valley to Merced.

The Caltrain/Morgan Hill/East 101/Pacheco Pass Alignment option is similar to the Caltrain/Morgan Hill/Pacheco Pass option, with the exception that utilizes the U.S. 101 corridor to connect to the Caltrain corridor north of Morgan Hill as opposed to south of Morgan Hill. Travel times would be slightly improved with this option, but there would be a reduction in compatibility with development and this option would provide less accessibility than the Caltrain/Morgan Hill/Pacheco Pass alternative. This option would not provide a direct link to the Caltrain commuter rail service south of San Jose. The Caltrain/Morgan Hill/East of 101/Pacheco Pass option would be entirely constructed on aerial structure and in tunnel configuration. Therefore, the cost of this option is expected to be slightly higher than the Caltrain/Morgan Hill/Pacheco Pass option that includes grade separation improvements to adjacent freight and commuter tracks. This alignment would pass through the highest length of floodplain of all the Pacheco Pass options.

Station Locations:

- **Morgan Hill (Foothills) Station**: This potential station site would only serve the Pacheco Pass/Foothills/Morgan Hill/Caltrain alternative that staff recommends be eliminated from further investigation.

- **Morgan Hill (E. of 101) Station:** This potential station would only serve the Pacheco Pass/East of 101/Caltrain alternative that staff recommends be eliminated from further investigation.